

1. An apparatus for optically storing information, the apparatus comprising:
a first input line configured to transmit first and second optical information
at a first frequency;
a recirculating loop configured to receive and circulate the first optical
information from the first input line;
a first frequency shifter connected in the recirculating loop and configured
to frequency-shift the first optical information; and
the recirculating loop, further configured to provide a frequency-stacked
signal by receiving and circulating the second optical information concurrently
with the first optical information.

2. The apparatus of claim 1, further comprising:
the first frequency shifter, further configured to frequency-shift the
frequency-stacked signal; and
the recirculating loop further configured to integrate a third optical
information into the frequency-stacked signal by receiving and circulating a third
optical information at the first frequency.

3. The apparatus of claim 2, further comprising:

a second frequency shifter connected to re-locate the first optical information at the first frequency by shifting the frequency-stacked signal; and
a third frequency shifter connected to re-locate the second optical information at the first frequency by shifting the frequency-stacked signal.

4. The apparatus of claim 3, further comprising:

a first filter operably connected to pass substantially only the first optical information from the frequency-stacked signal; and
a second filter operably connected to pass substantially only the second optical information from the frequency-stacked signal.

5. The apparatus of claim 4, further comprising an amplifier connected in the recirculating loop, the amplifier configured to amplify the frequency-stacked signal to reduce signal degradation.

6. The apparatus of claim 5, further comprising a frequency shift controller connected to control the first frequency shifter.

7. The apparatus of claim 6, wherein the recirculating loop further comprises a low pass filter configured to reduce signals corresponding to any frequencies above a limiting frequency.

8. The apparatus of claim 6, wherein the recirculating loop further comprises a high pass filter configured to reduce signals corresponding to any frequencies below a limiting frequency.

5 9. The apparatus of claim 2, further comprising a tunable filter operably connected to pass at least one of the first, second, and third information selected from the frequency-stacked signal.

10 10. The apparatus of claim 9, further comprising a detector and a laser, the detector operably connected to receive the information from the tunable filter and configured to modulate the laser therewith.

15 11. A method for storing optical information, the method comprising:
receiving first and second optical information, each having a first frequency associated therewith;

receiving and circulating the first optical information within a circulating loop;

frequency-shifting the first optical information; and

20 receiving and circulating the second optical information within the circulating loop to provide a frequency-stacked signal containing the first and second optical information.

12. The method of claim 11, further comprising:
frequency-shifting the frequency-stacked signal; and
providing a third optical information to the circulating loop and integrating
the third optical information in the frequency-stacked signal.

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13. The method of claim 12, further comprising:
receiving the frequency-stacked signal from the circulating loop;
frequency-shifting the frequency-stacked signal to re-locate the first
optical information at the first frequency;
receiving the frequency-stacked signal from the circulating loop; and
frequency-shifting the frequency-stacked signal to re-locate the second
optical information at the first frequency.

14. The method of claim 13, further comprising filtering the frequency-stacked
signal to extract therefrom the first optical information and the second optical
information.

15. The method of claim 14, further comprising amplifying the frequency-
stacked signal to reduce signal degradation.

16. The method of claim 15, further comprising controlling, by a frequency-
shift controller, the frequency-shifting within the circulating loop.

17. The method of claim 16, further comprising low-pass filtering the frequency-stacked signal to reduce any frequencies above a pre-selected frequency.

18. The method of claim 16, further comprising high-pass filtering the frequency-stacked signal to reduce any frequencies below a pre-selected frequency.

19. The method of claim 12, further comprising:
receiving the frequency-stacked signal from the circulating loop;
tuning a filter therefor; and
filtering, by the tunable filter, at least one of the first, second, and third optical information from the frequency-stacked signal.

20. The method of claim 19, further comprising:
detecting the selected optical information; and
modulating a laser in accordance therewith.